

## Eye Migration in Flat-fishes and Lamarckianism.

MR. R. H. LOCK, in his recent book on "Variation, Heredity, and Evolution" (reviewed in *NATURE* of April 27), has, in common with many other writers, adduced the phenomenon of eye transposition in flat-fishes as a cogent argument in favour of the transmission of acquired characters, remarking that "an alternative hypothesis is lacking." I venture to dispute this position, believing it to be decided evidence in support of the potency of natural selection to accumulate small mutations. I quote a part of the passage (p. 35) that my argument may be the better understood:—

"In the adult condition these fishes lie flat on one side; and during their development from the young condition that eye which, if it remained in its original position, would look directly downwards travels round the head until it comes to lie quite upon the upper surface. . . . The very young fish whilst still symmetrical, are known sometimes to fall upon one side, and when in this position to twist the lower eye forcibly upwards. Darwin himself therefore supposed that the origin of the adult structure is to be attributed to the inherited effect of efforts of this kind."

This misinterpretation of the phenomenon seems to me to arise from an inadequate appreciation of the nature of the actual variation, *i.e.* the capacity to twist the eye, which is exhibited by the young fish. The young of some other fish are known to exhibit the same muscular control over the orbit ("Origin of Species," p. 292), and we need only to suppose that the forerunner of the modern race of flat-fishes possessed it as a fortuitous variation to the extent of making vision just possible whilst in the recumbent position; and this would seem to be the case, for it is recorded in the "Origin of Species" that a young fish has been observed to "raise and depress the eye through an angular distance of about seventy degrees." In the transmission of the original variation to the offspring it is not the effect of the movement which is passed on, but the structural arrangements which enabled it to initiate the movement, the amplitude being increased in successive generations by the aid of natural selection.

This contention may be supported by citing a peculiar muscular capacity possessed by myself. I am able to raise and depress the right eyebrow independently of the left, but I have no such control over the other. To test whether this power may not be induced by practice, I have striven to raise the left whilst holding down the right, but find myself quite unable to accomplish it. Herein we see that the capacity to make the movement is of itself a distinct mutation; and assuming that in the case of the flat-fish mobility of the optic aperture was so far possible as to be of advantage to it, natural selection would operate in preserving those of the progeny which were able to retain the eye in the advantageous position with the least possible effort.

I have ventured to tender this explanation to the readers of *NATURE* because the phenomenon is very generally used as a good illustration of Lamarck's doctrine, and as being "inexplicable on the theory of natural selection."

Bournemouth, May 10.

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TWO WORKS ON INDIAN ETHNOGRAPHY.<sup>1</sup>

MR. CROOKE'S book appears in a series edited by Mr. N. W. Thomas which, to quote the general preface, "is intended to supply in handy and readable form the needs of those who wish to learn something of the life of the uncivilised races of our Empire." To Mr. Crooke has been entrusted the task of describing the races of northern India, and we may at once state that he has achieved very considerable success. The area covered, extending from Afghanistan to the Chinese

<sup>1</sup> "The Native Races of the British Empire. Natives of Northern India." By W. Crooke. Pp. xiv+270. (London: A. Constable and Co., Ltd., 1907.) Price 6s. net.

"The Khasis." By Major P. R. T. Gurdon, I.A. With an Introduction by Sir Charles Lyall, K.C.S.I. Pp. xxvii+227. (Published under the Orders of the Government of Eastern Bengal and Assam. London: D. Nutt, 1907.) Price 7s. 6d. net.

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frontier, is so great, and its aspects are so complicated, that not even such an authority as this distinguished scholar could venture into details within the limits of the two hundred and fifty odd pages at his disposal; but he has given a broad general view, sketching in with a few accurate and telling strokes the more prominent features of the landscape, so that the whole presents a satisfactory and attractive summary of the racial characteristics of an important section of the British Empire.

After a brief account of the country and of the influence of its environment upon the people, Mr. Crooke describes its three main physical race-types—the Mongoloid, the Dravidian, and the Indo-Aryan. The last-named leads him to the consideration of the castes of the great plains, to the Indian village and its industries, and to the home life, including the occupations of women, together with the games and amusements of the children. Turning to the religion of the people, we have first an account of the birth, marriage, and death rites, and then a general description of the popular religion, magic, and witchcraft. There are more than thirty admirable full-page illustrations, the value of which is somewhat impaired by the binder having placed them at approximately equal distances from each other throughout the book, without consideration of the context to which they refer, and which, in spite of a good index, it is not always easy to find. In other respects, too, the mechanical execution of the work leaves room for improvement. Proper names are not always spelt correctly. The well-known Norwegian philologist appears as Dr. "Steinkonow," and the proof-reader's ideas of the spelling of the name of a writer on Chota Nagpur oscillate between "Bartley-Birt" and "Bradley-Birt," the latter, of course, being the correct form. Worst of all, the numbering of the plates was evidently altered after the text had been printed off, so that not a single reference in the text to the plates is correct.

These are, however, but minor matters, which can easily be set right in the next edition, and for the work as a whole, although we may differ on a few controversial points, we have nothing but praise. Mr. Crooke, while following Mr. Risley in his conclusions as to the race-origins of the Indian people, shows a wise caution in accepting his opinion with regard to details, and, like other scholars, enters a protest against his undue extension of the name "Dravidian" (properly a linguistic term) to the entire mass of the population of northern India which is not Aryan or Mongolian. He himself, on the other hand, seems to have misunderstood the results of the latest philological researches when he states that it has been recently proved that the two great non-Aryan linguistic families of India, the Munda and the Dravidian, are mutually connected. He quotes Dr. Grierson's authority for this; but we are under the impression that, in his latest writings, that scholar has strongly maintained the distinct origin of these two groups of speeches, and the researches of Pater Schmidt, of Vienna, have shown that the Mundas are related, both ethnically and linguistically, to the Mon-Khmer tribes of Further India, and perhaps even to the inhabitants of Polynesia. As for the Dravidian languages, it seems not improbable, although positive proof is yet wanting, that they are connected with those of the aborigines of Australia. The fact that the speakers of Dravidian languages and the speakers of Munda languages have the same physical type has not yet been satisfactorily explained, but Dr. Sten Konow's theory that the common type is really Munda, and has been acquired by the Dravidian-speakers through intermarriage (just as the Indo-Aryan type of the Lower Ganges

Valley has been similarly altered) is at least worthy of attentive consideration.

In dealing with the general race question, Mr. Crooke adopts the only scientific method (too often neglected) of commencing at the bottom with the so-called aborigines and working upwards through the mixed tribes to the pure Indo-Aryan. His account of the wild hill-tribes, whether Mongoloid or Dravidian, is excellent, and brings together a mass of information that has hitherto been scattered through a number of not always accessible memoirs. When he comes to the Gangetic plains he is on his own ground, and writes at first hand. His unrivalled acquaintance with the people of the United Provinces, their customs, and their religion, makes this the most valuable section of the book. The

stress on his alleged ignorance of any literature. While books are almost unknown to him, he has not only ballad poetry, much of it of real excellence, but is more or less familiar with the works of the great religious writers of his country, such as Kabir or Tulsi Dās, and has had their best verses ready on his lips since childhood. Here, too, we may point out that while Mr. Crooke's account of Indian village religion is, so far as it goes, masterly, it only illustrates one side of the subject, the worship of local deities. He has failed to take into consideration the results of the great reformation of Hinduism which swept over northern India in the



FIG. 1.—Raja of Rampur, with attendants, Punjab Hills. From "Natives of Northern India."

thorny question of the origin of caste could not be adequately discussed without trenching on space which might more legitimately be devoted to other purposes; and he contents himself with stating his own opinion, which is a modification of that put forward by Mr. Risley. He considers that castes owe their inception partly to crystallisation of occupation and partly to the persistence of the idea of tribe. He gives the reader a vivid picture of the home-life of the plains villages. It is one with which most Indian officials and missionaries are familiar, but which has seldom been put in print. The existence of an Indian agriculturist is a laborious one, with little to relieve its monotony except a rare pilgrimage or the occasional chance of the greatest luxury of all, a lawsuit. Perhaps Mr. Crooke lays too much

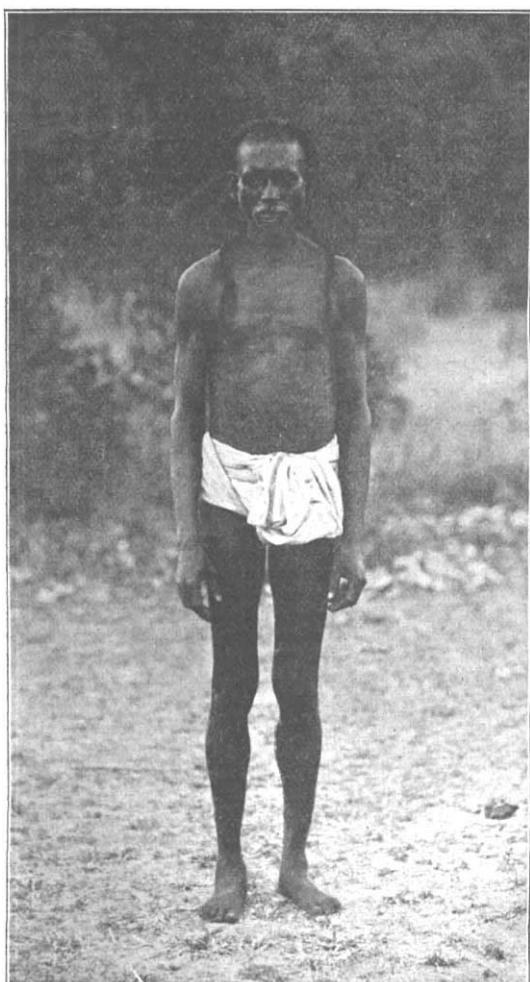


FIG. 2.—A Panka, Dravidian Weaver, Southern Hills. From "Natives of Northern India."

sixteenth century, and which has, in Rāma, given the village people a personal supreme deity, whom they can and do worship, and who is above all the local gods and godlings. The essence of the reformation was the discovery of the Fatherhood of God, and that fact alone has had immense influence in moulding the general character of the population of the Gangetic Valley.

If we have criticised a few of Mr. Crooke's statements, we freely admit that they deal with points of detail, some of which are objects of controversy. We can strongly recommend his book to the general reader who desires information regarding the native races of northern India. His style is always interest-

ing, and there is not a dull page from beginning to end of the volume.

Major Gurdon's work is the first of a series of monographs on the more important tribes and castes of Assam now being issued by the Government of that province. While Mr. Crooke deals with the broad outlines of the ethnology of the whole of northern India, this work is confined to a single tribe numbering less than two hundred thousand souls. Although they are so few, the Khasis are a race deserving special study. Half a century ago Logan showed their relationship to the distant Mons of Pegu and Khmers of Cambodia, but his researches lay hidden in a local magazine, so that, until Kuhn revived the question in 1883, it was the general impression that the tribe was an isolated survival from prehistoric times, whose language formed a distinct family by itself, and which had no connection with any other known race. The researches of Kuhn, and, later on, of Schmidt, have placed the whole subject on a new and sure footing. We now know that Khasi is a member of an important group of languages including forms of speech, such as Palaung and Wa, closely allied to Mon and Khmer, and also Nicobarese and the Munda tongues of India proper. Moreover, not only are the languages connected, but the speakers all possess the same racial characteristics. This language-group Schmidt has named the "Austro-Asiatic" subfamily, and he maintains that it is related to the "Austro-Nesian" subfamily spoken in Indonesia, Polynesia, and Melanesia—the two together forming, under the name of the "Austro-Asiatic" family, the most widely spread collection of allied speeches upon the face of the earth. A special and minute study, therefore, of the speakers of one of the members of this great family is just now well-timed and of considerable interest, and Major Gurdon, the superintendent of ethnography in Assam, is exceptionally fitted to undertake the task.

For the benefit of those who are not familiar with Indian ethnography, it may be stated that the Khasis are a tribe inhabiting the Khasi and Jaintia Hills in the Indian province of (as it is now called) Eastern Bengal and Assam. They are surrounded on all sides by alien peoples, Tibeto-Burman and Aryan, and are believed to be a survival of a primitive Austro-Asiatic race that once occupied the whole of eastern India until they were conquered and dispossessed in prehistoric times by an invasion of Tibeto-Burmans. The tribal constitution is strongly matriarchal. Inheritance is through the female line, the youngest daughter being the chief heir of her mother; ancestral property can only be owned by women, and the only property which a man can possess is that which is self-acquired. The chief deities are all female. So is the sun, while the moon is represented as a man, and in the grammar and vocabulary the feminine element is much more prominent than the masculine.

Besides chapters discussing introductory and miscellaneous topics, Major Gurdon's work is divided into five sections, dealing respectively with domestic life, laws and customs, religion, folklore, and language. Each subject is treated in great detail, and the book contains much new and valuable matter not hitherto recorded. We may direct special attention to the account of the remarkable memorial stones, menhirs, dolmens, and cromlechs scattered over the country, and also to that of the curious custom of egg-divining (*φορκονία*). The chapter on folklore is also most interesting. It contains a number of stories, both in the original text and in translation. These form part of a larger collection placed at the author's disposal by the Rev. Dr. Roberts, and we are glad to learn that there is a prospect of the entire series being published at some

future date. The full-page illustrations of the book are numerous and in their right places, and it is further enriched by an introduction from the accomplished pen of Sir Charles Lyall.

There have been Welsh missionaries among the Khasis for more than sixty years, and to them we owe the fact that the language has been reduced to writing. Under their fostering care the tongue of a once rude and barbarous people has been given an alphabet, a fixed system of spelling (based on Welsh), and a literature. It is now recognised by the Calcutta University as sufficiently cultivated to be offered as a subject for examination by candidates from Khasi-land.

We congratulate the Eastern Bengal and Assam Government on the successful inception of what promises to be a most interesting and useful series of monographs.

#### ASTRONOMICAL OBSERVATIONS IN PRAGUE 1900-1904.

THE Astronomical Observatory of Prague, like many other similar institutions which might be mentioned, has its work considerably restricted by the fact that the city in which it is situated has



Tycho Brahe's Observatories. A, On the island Hveen (Uranienborg); B, in Wandsbeck; C, in Benatek; D, in Prague (Ferdinandum); E, in Prague (Curtius's House).

grown. The restricted horizon, the smoke, and the glare of the illuminated air all have tended, year by year, to cut down the amount of useful work such an observatory is capable of doing, and it is quite possible that the time will soon come when it will